

SEQUENCE LISTING

<110> F. Hoffmann-La Roche AG

5 <120> PDE4D in atherosclerosis

<130> Case 21729

<160> 4

<170> PatentIn version 3.1

<210> 1

10 <211> 747

<212> PRT

<213> Mus musculus

<220>

<221> mouse PDE4D7

15 <222> (1)..(747)

<223>

<400> 1

Met Glu Arg Asn Thr Cys Asp Val Leu Ser Arg Ser Lys Ser Ala Ser

1 5 10 15

20 Glu Glu Thr Leu His Ser Cys Asn Asp Glu Glu Asp Pro Phe Arg Gly

20 25 30

Met Glu Pro Tyr Leu Val Arg Arg Leu Ser Ser Arg Ser Ile Gln Leu

35 40 45

Pro Pro Leu Ala Phe Arg Gln Leu Glu Gln Thr Asp Leu Arg Ser Glu

25 50 55 60

Ser Glu Asn Ile Pro Arg Pro Thr Ser Leu Pro Leu Lys Ile Leu Pro

65 70 75 80

Leu Ile Ala Val Thr Ser Ala Asp Ser Thr Gly Phe Asp Val Asp Asn
85 90 95

Gly Thr Ser Ala Gly Arg Ser Pro Leu Asp Pro Met Thr Ser Pro Gly
100 105 110

5 Ser Gly Leu Ile Leu Gln Ala Asn Phe Val His Ser Gln Arg Arg Glu
115 120 125

Ser Phe Leu Tyr Arg Ser Asp Ser Asp Tyr Asp Leu Ser Pro Lys Ser
130 135 140

Met Ser Arg Asn Ser Ser Ile Ala Ser Asp Ile His Gly Asp Asp Leu
10 145 150 155 160

Ile Val Thr Pro Phe Ala Gln Val Leu Ala Ser Leu Arg Thr Val Arg
165 170 175

Asn Asn Phe Ala Ala Leu Thr Asn Leu Gln Asp Arg Ala Pro Ser Lys
180 185 190

15 Arg Ser Pro Met Cys Asn Gln Pro Ser Ile Asn Lys Ala Thr Ile Thr
195 200 205

Glu Glu Ala Tyr Gln Lys Leu Ala Ser Glu Thr Leu Glu Glu Leu Asp
210 215 220

Trp Cys Leu Asp Gln Leu Glu Thr Leu Gln Thr Arg His Ser Val Ser
20 225 230 235 240

Glu Met Ala Ser Asn Lys Phe Lys Arg Met Leu Asn Arg Glu Leu Thr
245 250 255

His Leu Ser Glu Met Ser Arg Ser Gly Asn Gln Val Ser Glu Tyr Ile
260 265 270

25 Ser Asn Thr Phe Leu Asp Lys Gln His Glu Val Glu Ile Pro Ser Pro
275 280 285

Thr Gln Lys Glu Lys Glu Lys Lys Lys Arg Pro Met Ser Gln Ile Ser
 290 295 300
 Gly Val Lys Lys Leu Met His Ser Ser Ser Leu Thr Asn Ser Cys Ile
 305 310 315 320
 5 Pro Arg Phe Gly Val Lys Thr Glu Gln Glu Asp Val Leu Ala Lys Glu
 325 330 335
 Leu Glu Asp Val Asn Lys Trp Gly Leu His Val Phe Arg Ile Ala Glu
 340 345 350
 Leu Ser Gly Asn Arg Pro Leu Thr Val Ile Met His Thr Ile Phe Gln
 10 355 360 365
 Glu Arg Asp Leu Leu Lys Thr Phe Lys Ile Pro Val Asp Thr Leu Ile
 370 375 380
 Thr Tyr Leu Met Thr Leu Glu Asp His Tyr His Ala Asp Val Ala Tyr
 385 390 395 400
 15 His Asn Asn Ile His Ala Ala Asp Val Val Gln Ser Thr His Val Leu
 405 410 415
 Leu Ser Thr Pro Ala Leu Glu Ala Val Phe Thr Asp Leu Glu Ile Leu
 420 425 430
 Ala Ala Ile Phe Ala Ser Ala Ile His Asp Val Asp His Pro Gly Val
 20 435 440 445
 Ser Asn Gln Phe Leu Ile Asn Thr Asn Ser Glu Leu Ala Leu Met Tyr
 450 455 460
 Asn Asp Ser Ser Val Leu Glu Asn His His Leu Ala Val Gly Phe Lys
 465 470 475 480
 25 Leu Leu Gln Glu Glu Asn Cys Asp Ile Phe Gln Asn Leu Thr Lys Lys
 485 490 495

Gln Arg Gln Ser Leu Arg Lys Met Ala Ile Asp Ile Val Leu Ala Thr
500 505 510

Asp Met Ser Lys His Met Asn Leu Leu Ala Asp Leu Lys Thr Met Val
515 520 525

5 Glu Thr Lys Lys Val Thr Ser Ser Gly Val Leu Leu Leu Asp Asn Tyr
530 535 540

Ser Asp Arg Ile Gln Val Leu Gln Asn Met Val His Cys Ala Asp Leu
545 550 555 560

Ser Asn Pro Thr Lys Pro Leu Gln Leu Tyr Arg Gln Trp Thr Asp Arg
10 565 570 575

Ile Met Glu Glu Phe Phe Arg Gln Gly Asp Arg Glu Arg Glu Arg Gly
580 585 590

Met Glu Ile Ser Pro Met Cys Asp Lys His Asn Ala Ser Val Glu Lys
595 600 605

15 Ser Gln Val Gly Phe Ile Asp Tyr Ile Val His Pro Leu Trp Glu Thr
610 615 620

Trp Ala Asp Leu Val His Pro Asp Ala Gln Asp Ile Leu Asp Thr Leu
625 630 635 640

Glu Asp Asn Arg Glu Trp Tyr Gln Ser Thr Ile Pro Gln Ser Pro Ser
20 645 650 655

Pro Ala Pro Asp Asp Gln Glu Asp Gly Arg Gln Gly Gln Thr Glu Lys
660 665 670

Phe Gln Phe Glu Leu Thr Leu Glu Glu Asp Gly Glu Ser Asp Thr Glu
675 680 685

25 Lys Asp Ser Gly Ser Gln Val Glu Glu Asp Thr Ser Cys Ser Asp Ser
690 695 700

Lys Thr Leu Cys Thr Gln Asp Ser Glu Ser Thr Glu Ile Pro Leu Asp
705 710 715 720
Glu Gln Val Glu Glu Glu Ala Val Ala Glu Glu Glu Ser Gln Pro Gln
725 730 735
5 Thr Gly Val Ala Asp Asp Cys Cys Pro Asp Thr
740 745

<210> 2
<211> 747
10 <212> PRT
<213> Rattus norvegicus
<220>
<221> rat PDE4D7
<222> (1)..(747)
15 <223>
<400> 2
Met Glu Arg Asp Thr Cys Asp Val Leu Ser Arg Ser Lys Ser Ala Ser
1 5 10 15
Glu Glu Thr Leu His Ser Cys Asn Glu Glu Glu Asp Pro Phe Arg Gly
20 20 25 30
Met Glu Pro Tyr Leu Val Arg Arg Leu Ser Ser Arg Ser Ile Gln Leu
35 40 45
Pro Pro Leu Ala Phe Arg Gln Leu Glu Gln Ala Asp Leu Arg Ser Glu
50 55 60
25 Ser Glu Asn Ile Pro Arg Pro Thr Ser Leu Pro Leu Lys Ile Leu Pro
65 70 75 80

[illegible]

Thr Gln Lys Glu Lys Glu Lys Lys Lys Arg Pro Met Ser Gln Ile Ser
 290 295 300
 Gly Val Lys Lys Leu Met His Ser Ser Ser Leu Thr Asn Ser Cys Ile
 305 310 315 320
 5 Pro Arg Phe Gly Val Lys Thr Glu Gln Glu Asp Val Leu Ala Lys Glu
 325 330 335
 Leu Glu Asp Val Asn Lys Trp Gly Leu His Val Phe Arg Ile Ala Glu
 340 345 350
 Leu Ser Gly Asn Arg Pro Leu Thr Val Ile Met His Thr Ile Phe Gln
 10 355 360 365
 Glu Arg Asp Leu Leu Lys Thr Phe Lys Ile Pro Val Asp Thr Leu Ile
 370 375 380
 Thr Tyr Leu Met Thr Leu Glu Asp His Tyr His Ala Asp Val Ala Tyr
 385 390 395 400
 15 His Asn Asn Ile His Ala Ala Asp Val Val Gln Ser Thr His Val Leu
 405 410 415
 Leu Ser Thr Pro Ala Leu Glu Ala Val Phe Thr Asp Leu Glu Ile Leu
 420 425 430
 Ala Ala Ile Phe Ala Ser Ala Ile His Asp Val Asp His Pro Gly Val
 20 435 440 445
 Ser Asn Gln Phe Leu Ile Asn Thr Asn Ser Glu Leu Ala Leu Met Tyr
 450 455 460
 Asn Asp Ser Ser Val Leu Glu Asn His His Leu Ala Val Gly Phe Lys
 465 470 475 480
 25 Leu Leu Gln Glu Glu Asn Cys Asp Ile Phe Gln Asn Leu Thr Lys Lys
 485 490 495

Gln Arg Gln Ser Leu Arg Lys Met Val Ile Asp Ile Val Leu Ala Thr
 500 505 510
 Asp Met Ser Lys His Met Asn Leu Leu Ala Asp Leu Lys Thr Met Val
 515 520 525
 5 Glu Thr Lys Lys Val Thr Ser Ser Gly Val Leu Leu Leu Asp Asn Tyr
 530 535 540
 Ser Asp Arg Ile Gln Val Leu Gln Asn Met Val His Cys Ala Asp Leu
 545 550 555 560
 Ser Asn Pro Thr Lys Pro Leu Gln Leu Tyr Arg Gln Trp Thr Asp Arg
 10 565 570 575
 Ile Met Glu Glu Phe Phe Arg Gln Gly Asp Arg Glu Arg Glu Arg Gly
 580 585 590
 Met Glu Ile Ser Pro Met Cys Asp Lys His Asn Ala Ser Val Glu Lys
 595 600 605
 15 Ser Gln Val Gly Phe Ile Asp Tyr Ile Val His Pro Leu Trp Glu Thr
 610 615 620
 Trp Ala Asp Leu Val His Pro Asp Ala Gln Asp Ile Leu Asp Thr Leu
 625 630 635 640
 Glu Asp Asn Arg Glu Trp Tyr Gln Ser Thr Ile Pro Gln Ser Pro Ser
 20 645 650 655
 Pro Ala Pro Asp Asp Gln Glu Glu Gly Arg Gln Gly Gln Thr Glu Lys
 660 665 670
 Phe Gln Phe Glu Leu Thr Leu Glu Glu Asp Cys Glu Ser Asp Thr Glu
 675 680 685
 25 Lys Asp Ser Gly Ser Gln Val Glu Glu Asp Thr Ser Cys Ser Asp Ser
 690 695 700

9/22

Lys Thr Leu Cys Thr Gln Asp Ser Glu Ser Thr Glu Ile Pro Leu Asp
705 710 715 720
Glu Gln Val Glu Glu Glu Ala Val Ala Glu Glu Glu Ser Gln Pro Glu
725 730 735
5 Thr Cys Val Pro Asp Asp Cys Cys Pro Asp Thr
740 745

<210> 3
<211> 748
10 <212> PRT
<213> Homo sapiens
<220>
<221> human PDE4D7
<222> (1)..(748)
15 <223>
<400> 3

Met Lys Arg Asn Thr Cys Asp Leu Leu Ser Arg Ser Lys Ser Ala Ser
1 5 10 15
Glu Glu Thr Leu His Ser Ser Asn Glu Glu Glu Asp Pro Phe Arg Gly
20 20 25 30
Met Glu Pro Tyr Leu Val Arg Arg Leu Ser Cys Arg Asn Ile Gln Leu
35 40 45
Pro Pro Leu Ala Phe Arg Gln Leu Glu Gln Ala Asp Leu Lys Ser Glu
50 55 60
25 Ser Glu Asn Ile Gln Arg Pro Thr Ser Leu Pro Leu Lys Ile Leu Pro
65 70 75 80

10/22

Leu Ile Ala Ile Thr Ser Ala Glu Ser Ser Gly Phe Asp Val Asp Asn
85 90 95
Gly Thr Ser Ala Gly Arg Ser Pro Leu Asp Pro Met Thr Ser Pro Gly
100 105 110
5 Ser Gly Leu Ile Leu Gln Ala Asn Phe Val His Ser Gln Arg Arg Glu
115 120 125
Ser Phe Leu Tyr Arg Ser Asp Ser Asp Tyr Asp Leu Ser Pro Lys Ser
130 135 140
Met Ser Arg Asn Ser Ser Ile Ala Ser Asp Ile His Gly Asp Asp Leu
10 145 150 155 160
Ile Val Thr Pro Phe Ala Gln Val Leu Ala Ser Leu Arg Thr Val Arg
165 170 175
Asn Asn Phe Ala Ala Leu Thr Asn Leu Gln Asp Arg Ala Pro Ser Lys
180 185 190
15 Arg Ser Pro Met Cys Asn Gln Pro Ser Ile Asn Lys Ala Thr Ile Thr
195 200 205
Glu Glu Ala Tyr Gln Lys Leu Ala Ser Glu Thr Leu Glu Glu Leu Asp
210 215 220
Trp Cys Leu Asp Gln Leu Glu Thr Leu Gln Thr Arg His Ser Val Ser
20 225 230 235 240
Glu Met Ala Ser Asn Lys Phe Lys Arg Met Leu Asn Arg Glu Leu Thr
245 250 255
His Leu Ser Glu Met Ser Arg Ser Gly Asn Gln Val Ser Glu Phe Ile
260 265 270
25 Ser Asn Thr Phe Leu Asp Lys Gln His Glu Val Glu Ile Pro Ser Pro
275 280 285

11/22

Thr Gln Lys Glu Lys Glu Lys Lys Lys Arg Pro Met Ser Gln Ile Ser
290 295 300
Gly Val Lys Lys Leu Met His Ser Ser Ser Leu Thr Asn Ser Ser Ile
305 310 315 320
5 Pro Arg Phe Gly Val Lys Thr Glu Gln Glu Asp Val Leu Ala Lys Glu
325 330 335
Leu Glu Asp Val Asn Lys Trp Gly Leu His Val Phe Arg Ile Ala Glu
340 345 350
Leu Ser Gly Asn Arg Pro Leu Thr Val Ile Met His Thr Ile Phe Gln
10 355 360 365
Glu Arg Asp Leu Leu Lys Thr Phe Lys Ile Pro Val Asp Thr Leu Ile
370 375 380
Thr Tyr Leu Met Thr Leu Glu Asp His Tyr His Ala Asp Val Ala Tyr
385 390 395 400
15 His Asn Asn Ile His Ala Ala Asp Val Val Gln Ser Thr His Val Leu
405 410 415
Leu Ser Thr Pro Ala Leu Glu Ala Val Phe Thr Asp Leu Glu Ile Leu
420 425 430
Ala Ala Ile Phe Ala Ser Ala Ile His Asp Val Asp His Pro Gly Val
20 435 440 445
Ser Asn Gln Phe Leu Ile Asn Thr Asn Ser Glu Leu Ala Leu Met Tyr
450 455 460
Asn Asp Ser Ser Val Leu Glu Asn His His Leu Ala Val Gly Phe Lys
465 470 475 480
25 Leu Leu Gln Glu Glu Asn Cys Asp Ile Phe Gln Asn Leu Thr Lys Lys
485 490 495

12/22

Gln Arg Gln Ser Leu Arg Lys Met Val Ile Asp Ile Val Leu Ala Thr
500 505 510

Asp Met Ser Lys His Met Asn Leu Leu Ala Asp Leu Lys Thr Met Val
515 520 525

5 Glu Thr Lys Lys Val Thr Ser Ser Gly Val Leu Leu Leu Asp Asn Tyr
530 535 540

Ser Asp Arg Ile Gln Val Leu Gln Asn Met Val His Cys Ala Asp Leu
545 550 555 560

Ser Asn Pro Thr Lys Pro Leu Gln Leu Tyr Arg Gln Trp Thr Asp Arg
10 565 570 575

Ile Met Glu Glu Phe Phe Arg Gln Gly Asp Arg Glu Arg Glu Arg Gly
580 585 590

Met Glu Ile Ser Pro Met Cys Asp Lys His Asn Ala Ser Val Glu Lys
595 600 605

15 Ser Gln Val Gly Phe Ile Asp Tyr Ile Val His Pro Leu Trp Glu Thr
610 615 620

Trp Ala Asp Leu Val His Pro Asp Ala Gln Asp Ile Leu Asp Thr Leu
625 630 635 640

Glu Asp Asn Arg Glu Trp Tyr Gln Ser Thr Ile Pro Gln Ser Pro Ser
20 645 650 655

Pro Ala Pro Asp Asp Pro Glu Glu Gly Arg Gln Gly Gln Thr Glu Lys
660 665 670

Phe Gln Phe Glu Leu Thr Leu Glu Glu Asp Gly Glu Ser Asp Thr Glu
675 680 685

25 Lys Asp Ser Gly Ser Gln Val Glu Glu Asp Thr Ser Cys Ser Asp Ser
690 695 700

Lys Thr Leu Cys Thr Gln Asp Ser Glu Ser Thr Glu Ile Pro Leu Asp
705 710 715 720
Glu Gln Val Glu Glu Glu Ala Val Gly Glu Glu Glu Glu Ser Gln Pro
725 730 735
5 Glu Ala Cys Val Ile Asp Asp Arg Ser Pro Asp Thr
740 745

<210> 4
<211> 747
10 <212> PRT
<213> Homo sapiens
<220>
<221> human PDE4D5
<222> (1) .. (747)
15 <223> .

<400> 4

Met Ala Gln Gln Thr Ser Pro Asp Thr Leu Thr Val Pro Glu Val Asp
1 5 10 15
Asn Pro His Cys Pro Asn Pro Trp Leu Asn Glu Asp Leu Val Lys Ser
20 20 25 30
Leu Arg Glu Asn Leu Leu Gln His Glu Lys Ser Lys Thr Ala Arg Lys
35 40 45
Ser Val Ser Pro Lys Leu Ser Pro Val Ile Ser Pro Arg Asn Ser Pro
50 55 60
25 Arg Leu Leu Arg Arg Met Leu Leu Ser Ser Asn Ile Pro Lys Gln Arg
65 70 75 80

14/22

Arg Phe Thr Val Ala His Thr Cys Lys Leu Phe Asp Val Asp Asn Gly
85 90 95

Thr Ser Ala Gly Arg Ser Pro Leu Asp Pro Met Thr Ser Pro Gly Ser
100 105 110

5 Gly Leu Ile Leu Gln Ala Asn Phe Val His Ser Gln Arg Arg Glu Ser
115 120 125

Phe Leu Tyr Arg Ser Asp Ser Asp Tyr Asp Leu Ser Pro Lys Ser Met
130 135 140

Ser Arg Asn Ser Ser Ile Ala Ser Asp Ile His Gly Asp Asp Leu Ile
10 145 150 155 160

Val Thr Pro Phe Ala Gln Val Leu Ala Ser Leu Arg Thr Val Arg Asn
165 170 175

Asn Phe Ala Ala Leu Thr Asn Leu Gln Asp Arg Ala Pro Ser Lys Arg
180 185 190

15 Ser Pro Met Cys Asn Gln Pro Ser Ile Asn Lys Ala Thr Ile Thr Glu
195 200 205

Glu Ala Tyr Gln Lys Leu Ala Ser Glu Thr Leu Glu Glu Leu Asp Trp
210 215 220

Cys Leu Asp Gln Leu Glu Thr Leu Gln Thr Arg His Ser Val Ser Glu
20 225 230 235 240

Met Ala Ser Asn Lys Phe Lys Arg Met Leu Asn Arg Glu Leu Thr His
245 250 255

Leu Ser Glu Met Ser Arg Ser Gly Asn Gln Val Ser Glu Phe Ile Ser
260 265 270

25 Asn Thr Phe Leu Asp Lys Gln His Glu Val Glu Ile Pro Ser Pro Thr
275 280 285

Gln Lys Glu Lys Glu Lys Lys Lys Arg Pro Met Ser Gln Ile Ser Gly
290 295 300

Val Lys Lys Leu Met His Ser Ser Ser Leu Thr Asn Ser Ser Ile Pro
305 310 315 320

5 Arg Phe Gly Val Lys Thr Glu Gln Glu Asp Val Leu Ala Lys Glu Leu
325 330 335

Glu Asp Val Asn Lys Trp Gly Leu His Val Phe Arg Ile Ala Glu Leu
340 345 350

Ser Gly Asn Arg Pro Leu Thr Val Ile Met His Thr Ile Phe Gln Glu
10 355 360 365

Arg Asp Leu Leu Lys Thr Phe Lys Ile Pro Val Asp Thr Leu Ile Thr
370 375 380

Tyr Leu Met Thr Leu Glu Asp His Tyr His Ala Asp Val Ala Tyr His
385 390 395 400

15 Asn Asn Ile His Ala Ala Asp Val Val Gln Ser Thr His Val Leu Leu
405 410 415

Ser Thr Pro Ala Leu Glu Ala Val Phe Thr Asp Leu Glu Ile Leu Ala
420 425 430

Ala Ile Phe Ala Ser Ala Ile His Asp Val Asp His Pro Gly Val Ser
20 435 440 445

Asn Gln Phe Leu Ile Asn Thr Asn Ser Glu Leu Ala Leu Met Tyr Asn
450 455 460

Asp Ser Ser Val Leu Glu Asn His His Leu Ala Val Gly Phe Lys Leu
465 470 475 480

25 Leu Gln Glu Glu Asn Cys Asp Ile Phe Gln Asn Leu Thr Lys Lys Gln
485 490 495

Arg Gln Ser Leu Arg Lys Met Val Ile Asp Ile Val Leu Ala Thr Asp
500 505 510

Met Ser Lys His Met Asn Leu Leu Ala Asp Leu Lys Thr Met Val Glu
515 520 525

5 Thr Lys Lys Val Thr Ser Ser Gly Val Leu Leu Leu Asp Asn Tyr Ser
530 535 540

Asp Arg Ile Gln Val Leu Gln Asn Met Val His Cys Ala Asp Leu Ser
545 550 555 560

Asn Pro Thr Lys Pro Leu Gln Leu Tyr Arg Gln Trp Thr Asp Arg Ile
10 565 570 575

Met Glu Glu Phe Phe Arg Gln Gly Asp Arg Glu Arg Glu Arg Gly Met
580 585 590

Glu Ile Ser Pro Met Cys Asp Lys His Asn Ala Ser Val Glu Lys Ser
595 600 605

15 Gln Val Gly Phe Ile Asp Tyr Ile Val His Pro Leu Trp Glu Thr Trp
610 615 620

Ala Asp Leu Val His Pro Asp Ala Gln Asp Ile Leu Asp Thr Leu Glu
625 630 635 640

Asp Asn Arg Glu Trp Tyr Gln Ser Thr Ile Pro Gln Ser Pro Ser Pro
20 645 650 655

Ala Pro Asp Asp Pro Glu Glu Gly Arg Gln Gly Gln Thr Glu Lys Phe
660 665 670

Gln Phe Glu Leu Thr Leu Glu Glu Asp Gly Glu Ser Asp Thr Glu Lys
675 680 685

25 Asp Ser Gly Ser Gln Val Glu Glu Asp Thr Ser Cys Ser Asp Ser Lys
690 695 700

Thr Leu Cys Thr Gln Asp Ser Glu Ser Thr Glu Ile Pro Leu Asp Glu
705 710 715 720
Gln Val Glu Glu Glu Ala Val Gly Glu Glu Glu Glu Ser Gln Pro Glu
725 730 735
5 Ala Cys Val Ile Asp Asp Arg Ser Pro Asp Thr
740 745

<210> 5
<211> 664
10 <212> PRT
<213> Homo sapiens
<220>
<221> core PDE4D
<222> (1)..(664)
15
<223>
<400> 5

Met Phe Asp Val Asp Asn Gly Thr Ser Ala Gly Arg Ser Pro Leu Asp
1 5 10 15
20 Pro Met Thr Ser Pro Gly Ser Gly Leu Ile Leu Gln Ala Asn Phe Val
20 25 30
His Ser Gln Arg Arg Glu Ser Phe Leu Tyr Arg Ser Asp Ser Asp Tyr
35 40 45
Asp Leu Ser Pro Lys Ser Met Ser Arg Asn Ser Ser Ile Ala Ser Asp
25 50 55 60
Ile His Gly Asp Asp Leu Ile Val Thr Pro Phe Ala Gln Val Leu Ala
65 70 75 80

Ser Leu Arg Thr Val Arg Asn Asn Phe Ala Ala Leu Thr Asn Leu Gln
85 90 95

Asp Arg Ala Pro Ser Lys Arg Ser Pro Met Cys Asn Gln Pro Ser Ile
100 105 110

5 Asn Lys Ala Thr Ile Thr Glu Glu Ala Tyr Gln Lys Leu Ala Ser Glu
115 120 125

Thr Leu Glu Glu Leu Asp Trp Cys Leu Asp Gln Leu Glu Thr Leu Gln
130 135 140

Thr Arg His Ser Val Ser Glu Met Ala Ser Asn Lys Phe Lys Arg Met
10 145 150 155 160

Leu Asn Arg Glu Leu Thr His Leu Ser Glu Met Ser Arg Ser Gly Asn
165 170 175

Gln Val Ser Glu Phe Ile Ser Asn Thr Phe Leu Asp Lys Gln His Glu
180 185 190

15 Val Glu Ile Pro Ser Pro Thr Gln Lys Glu Lys Glu Lys Lys Lys Arg
195 200 205

Pro Met Ser Gln Ile Ser Gly Val Lys Lys Leu Met His Ser Ser Ser
210 215 220

Leu Thr Asn Ser Ser Ile Pro Arg Phe Gly Val Lys Thr Glu Gln Glu
20 225 230 235 240

Asp Val Leu Ala Lys Glu Leu Glu Asp Val Asn Lys Trp Gly Leu His
245 250 255

Val Phe Arg Ile Ala Glu Leu Ser Gly Asn Arg Pro Leu Thr Val Ile
260 265 270

25 Met His Thr Ile Phe Gln Glu Arg Asp Leu Leu Lys Thr Phe Lys Ile
275 280 285

Pro Val Asp Thr Leu Ile Thr Tyr Leu Met Thr Leu Glu Asp His Tyr
 290 295 300
 His Ala Asp Val Ala Tyr His Asn Asn Ile His Ala Ala Asp Val Val
 305 310 315 320
 5 Gln Ser Thr His Val Leu Leu Ser Thr Pro Ala Leu Glu Ala Val Phe
 325 330 335
 Thr Asp Leu Glu Ile Leu Ala Ala Ile Phe Ala Ser Ala Ile His Asp
 340 345 350
 Val Asp His Pro Gly Val Ser Asn Gln Phe Leu Ile Asn Thr Asn Ser
 10 355 360 365
 Glu Leu Ala Leu Met Tyr Asn Asp Ser Ser Val Leu Glu Asn His His
 370 375 380
 Leu Ala Val Gly Phe Lys Leu Leu Gln Glu Glu Asn Cys Asp Ile Phe
 385 390 395 400
 15 Gln Asn Leu Thr Lys Lys Gln Arg Gln Ser Leu Arg Lys Met Val Ile
 405 410 415
 Asp Ile Val Leu Ala Thr Asp Met Ser Lys His Met Asn Leu Leu Ala
 420 425 430
 Asp Leu Lys Thr Met Val Glu Thr Lys Lys Val Thr Ser Ser Gly Val
 20 435 440 445
 Leu Leu Leu Asp Asn Tyr Ser Asp Arg Ile Gln Val Leu Gln Asn Met
 450 455 460
 Val His Cys Ala Asp Leu Ser Asn Pro Thr Lys Pro Leu Gln Leu Tyr
 465 470 475 480
 25 Arg Gln Trp Thr Asp Arg Ile Met Glu Glu Phe Phe Arg Gln Gly Asp
 485 490 495

Arg Glu Arg Glu Arg Gly Met Glu Ile Ser Pro Met Cys Asp Lys His
500 505 510

Asn Ala Ser Val Glu Lys Ser Gln Val Gly Phe Ile Asp Tyr Ile Val
515 520 525

5 His Pro Leu Trp Glu Thr Trp Ala Asp Leu Val His Pro Asp Ala Gln
530 535 540

Asp Ile Leu Asp Thr Leu Glu Asp Asn Arg Glu Trp Tyr Gln Ser Thr
545 550 555 560

Ile Pro Gln Ser Pro Ser Pro Ala Pro Asp Asp Pro Glu Glu Gly Arg
10 565 570 575

Gln Gly Gln Thr Glu Lys Phe Gln Phe Glu Leu Thr Leu Glu Glu Asp
580 585 590

Gly Glu Ser Asp Thr Glu Lys Asp Ser Gly Ser Gln Val Glu Glu Asp
595 600 605

15 Thr Ser Cys Ser Asp Ser Lys Thr Leu Cys Thr Gln Asp Ser Glu Ser
610 615 620

Thr Glu Ile Pro Leu Asp Glu Gln Val Glu Glu Glu Ala Val Gly Glu
625 630 635 640

Glu Glu Glu Ser Gln Pro Glu Ala Cys Val Ile Asp Asp Arg Ser Pro
20 645 650 655

Asp Thr His His His His His His
660

<210> 6

25 <211> 87

<212> PRT

<213> Homo sapiens

<220>

<221> human PDE4D5 N-terminal domain

<222> (1)..(87)

5 <223>

<400> 6

Met Ala Gln Gln Thr Ser Pro Asp Thr Leu Thr Val Pro Glu Val Asp

1 5 10 15

Asn Pro His Cys Pro Asn Pro Trp Leu Asn Glu Asp Leu Val Lys Ser

10 20 25 30

Leu Arg Glu Asn Leu Leu Gln His Glu Lys Ser Lys Thr Ala Arg Lys

35 40 45

Ser Val Ser Pro Lys Leu Ser Pro Val Ile Ser Pro Arg Asn Ser Pro

50 55 60

15 Arg Leu Leu Arg Arg Met Leu Leu Ser Ser Asn Ile Pro Lys Gln Arg

65 70 75 80

Arg Phe Thr Val Ala His Thr

85

<210> 7

20 <211> 88

<212> PRT

<213> Rattus norvegicus

<220>

<221> rat PDE4D5 N-terminal domain

25 <222> (1)..(88)

<223>

<400> 7

Met Ala Gln Gln Thr Thr Ser Pro Asp Thr Leu Thr Val Pro Glu Val

1 5 10 15

Asp Asn Pro His Val Pro Asn Pro Trp Leu Asn Glu Asp Leu Val Lys

5 20 25 30

Ser Leu Arg Glu Asn Leu Leu Gln His Glu Lys Ser Lys Thr Ala Arg

35 40 45

Lys Ser Val Ser Pro Lys Leu Ser Pro Val Ile Ser Pro Arg Asn Ser

50 55 60

10 Pro Arg Leu Leu Arg Arg Met Leu Leu Ser Ser Asn Ile Pro Lys Gln

65 70 75 80

Arg Arg Phe Thr Val Ala His Thr

85

15